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THE NEW MENTALIST PARADIGM AND ULTIMATE CONCERN

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I

With a scientist's faith in empirically verified truth and a long commitment to the brain, behavioral, and life sciences, I spent most of my working years believing in scientific explanations of Man, life, and the universe. The more I learned about the workings of the brain and its methods of processing information, the stronger became my allegiance to the kind of truth that receives objective support in the outside world.

Nevertheless, without abandoning or compromising scientific principles, I have come around today to rejecting the materialist doctrine of twentieth-century science and its claim that everything in the universe can be accounted for in strictly physical, mass-energy terms without reference to mental or conscious forces. As a brain scientist, I now believe in the causal reality of conscious mental powers as emergent properties of brain activity and consider subjective belief to be a potent cognitive force which, above any other, shapes the course of human affairs and events in the civilized world.

This turnabout in my system of belief began with some changed concepts concerning consciousness and the relation of mind to the physical brain. It soon became apparent that if the revised mind-brain concepts were to gain general acceptance, the implications would transform our scientific views of both human and nonhuman nature and of the kinds of forces in control. Among the many human value and worldview spin-offs, I could foresee the foundations emerging for a global ethic for all nations based in the neutral universality of scientific truth and promot-

This essay is the outcome of an invitation to write a personal account of the beliefs I live by as a scientist and how I put them into action. Designed for a popular volume of similar essays by prominent contemporaries, it is presented here with some minor revisions and a few references.

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ing values that would tend to preserve and enhance our world instead of destroying it. As these and other ramifications began to unfold, I found myself being drawn more and more away from the world of the laboratory and split-brain research into these more compelling and critically urgent ideologic issues relating science to values and belief.

From the standpoint of the brain's cognitive processing, one can hardly overrate the central control power of the belief system as a shaper of both individual and social behavior. What we believe determines what we value, what we choose, and how we act. Current global crises are all man-made and essentially products of human values and beliefs. For these there is no technological fix. Technical advances, despite short-term benefits, make matters worse in the long run in the absence of population controls by progressively elevating the level of a self-feeding vicious spiral in which we then get trapped deeper and deeper. It follows that any lasting solution will require changes in the sustaining value-belief systems. I believe human destiny and the fate of our whole biosphere hang directly on the kinds of beliefs future generations (let us hope, to come) elect to live and be governed by.

The beliefs that count most are not those about ordinary day-to-day concerns and basic subsistence but, rather, the higher religious, philosophic, and ideologic beliefs; the kind people live and die for, beliefs that concern life's purpose and meaning, beliefs about God, the human psyche, and its role in the cosmic scheme. Such beliefs determine a society's judgment of how things ought to be in the world, the cultural sense of value, of moral right and wrong and social justice. The force of belief in thousands of millions of minds, determining how people think, what they value and decide, shapes the course of history and is in no small part responsible for the current precarious state of the human condition.

II

Trouble comes, as daily headlines and history affirm, when these powerful movers and shapers of the human endeavor come into conflict—either with each other or with reality. Despite great advances in our knowledge about the universe and the ways of nature, current belief systems around the world remain so incompatible that, if we accept as true the cherished beliefs of one people, it follows that many truths upheld as sacred by other peoples must be false and misleading. While there appear to be real advantages in having a healthy religious diversity, belief differences carried to the extent of mutual incredibility and intolerance become a major cause of world conflict—not to mention the serious doubts raised about which of the various versions of belief, if any, represents real truth.

Probably the widest, deepest rift in contemporary culture and the source of its most profound conflict is that separating the two major opposing views of existence upheld by science and by orthodox religions, respectively. Together they present two totally different kinds of "truth," the former asking us to accept impersonal mass-energy accounts of the cosmos, the latter requiring faith in varied spiritual explanations. As emphasized by Andrew Greeley [1] and others, it comes down to a choice between these two great antithetical conceptions of ultimate reality: one offering a universe with a supreme plan, spirituality, purpose, and higher meaning; the other describing a spiritually devoid, physically driven cosmos run by chance and quantum mechanics.

For me, as a scientist, the great crisis of contemporary belief is that science, so demonstrably successful and in touch with reality in most respects, increasingly teaches that we and our world are but the product of a passing fluke of physics, ultimately lacking in purpose or meaning. Science seems further to insist that the whole of our conscious existence is merely an accessory, impotent, and superfluous attribute, aspect, or epiphenomenal correlate of brain physiology, arising out of and ending in oblivion.

In any case it is painfully evident that present-day civilization is obliged to operate from two very different and irreconcilable beliefs about ultimate reality: the one lacking credibility in the light of modern science; the other lacking in humanistic appeal and flying directly in the face of everyday experience. Following the most common practice for coping with this dilemma, I tried for many years to accept each scheme within its own realm, keeping the two strictly separate. When matters of moral, religious, or related humanistic concerns were involved, my scientific convictions had to be left elsewhere. Conversely, in matters of the laboratory, any mental or spiritual explanations were, of course, emphatically excluded.

This same double standard has pervasive political and legal manifestations. It is involved in the separation of church and state and widely endorsed throughout Western society. The U.S. National Academy of Sciences recently introduced a booklet on *Science and Creationsim* [2] citing a resolution of its council that "religion and science are separate and mutually exclusive realms of human thought whose presentation in the same context leads to misunderstanding of both scientific theory and religious belief."

I personally find this kind of thinking leaves much to be desired. If two systems of belief concerning such vital things as the nature and origins of humankind, life, the universe, and the kinds of forces in control are perceived to stand in direct contradiction to each other and to be indeed "mutually exclusive," then certainly something must be seriously wrong!

III

During the past 20 years I have become increasingly convinced that there is now another, better "way to go." I can see an alternative kind of answer to this dilemma, a different vision of the universe, emerging out of recently developed concepts of consciousness and the causal relations and interactions of mind and matter. A different scientific mode of thinking is called for, a different way of viewing ourselves and the world that combines and reconciles the spiritual-versus-material frameworks of the past. This new scheme integrates features from both sides of the old dichotomy—the mental and the physical, fact and value, subjective and objective, freedom and determinism—uniting them at different hierarchic levels into a single, consistent, worldview synthesis.

Thus, instead of vacillating between two antithetical versions of ultimate reality, I now rely on a single third choice that seemingly embodies the more credible aspects of both earlier views, relinquishing dualist supernatural beliefs on the one side and the strictly reductive physicalist beliefs on the other. With this new frame of reference I have much less trouble resolving moral issues such as those that have arisen between East and West or between fundamentalists and liberals like the Moral Majority and the secular humanists. Further, I no longer need to keep my religion and my science separate.

This new outlook on existence did not come from any intentional search for new beliefs on my part but arose secondarily out of a long search for a better answer to the age-old mind-brain problem. In the course of wrestling with questions of conscious unity in the surgically separated hemispheres of split-brain patients back in the mid-1960s, I discovered that my long-trusted behaviorist faith in strictly objective explanation rested on a logical flaw and was outweighed by a new reasoning. I became convinced that conscious experience could be best conceived as having an integral, causal control role in brain processing and that science had been wrong in denying this for more than half a century. Challenging basic presuppositions of determinism in brain science, I inferred that the conscious experience of the whole brain, besides being "different from and more than the sum of" the conscious properties of the two separate hemispheres, must also causally determine the patterns of neuronal firing in each hemisphere without interfering with the physical or chemical laws of neural processing at the physiological level.

Instead of excluding mind and spirit, as had been the rule for all of us in brain-behavior science for many decades, my new logic required that mental and "spiritual" forces be reinstated at the top of the brain's causal control hierarchy as real interactive "emergent" properties of brain processes and given primacy in determining what a person is and does. For

science, it put the long banished conscious, mental forces back in the brain—and "in the driver's seat as the crowning achievement of some 500 million years or more of evolution." It followed further that, not only in the brain but throughout nature, the more highly evolved "macro" properties of all things exert downward control over the lower "micro" properties of the components.

IV

My first attempt to act on these newfound beliefs was to test them in the marketplace of professional opinion through lectures and articles [3, 4]. I had no direct proof, of course, for these new ideas about consciousness, any more than there had been proof for the old views upheld in behaviorist and materialist thinking. The best I could do was to put them in print where the new reasoning could be pondered, weighed, and analyzed by thousands of critical minds. The majority feedback over an initial 4-year trial period encouraged me to risk more formal presentations during 1968 and 1969 in neurology [5], in psychology [6], and to our National Academy of Sciences [7]. The abrupt swing thereafter in American psychology toward a new acceptance of subjective mental phenomena in scientific explanation was enormously reassuring. This conceptual turnabout, referred to variously as the "consciousness," "humanist," "cognitive," or "mentalist" revolution, meant that the changed "interactionist" view of consciousness as causally operative in brain function and behavior had acquired majority support in a large scientific discipline. Meanwhile, the more basic sciences—physics, chemistry, and microbiology—continued to adhere predominantly to their traditional "microdeterminist" position. As a result, we have today within science (and philosophy) two ongoing fundamentally opposed beliefs about the nature of causal determinism.

In simple terms the dispute comes down to whether a newly evolved whole (entity or system) interacts entirely through the properties of its component elements, or whether whole entities in nature are also governed by novel emergent properties of their own, and, if so, whether the holistic properties in turn exert downward control over the parts. In the brain it is a question of higher mental over lower neuronal properties, but the issue is universal. Ultimately it is a question of the kinds of forces that are in control in our world and within ourselves, namely, the forces that made and move the universe and created man.

On the one side, in accord with traditional views in science, we and all our thoughts, behavior, and decisions, as well as everything around us throughout the cosmos, are controlled by strictly physicochemical forces that ultimately reduce to quantum mechanics. Everything in the brain and elsewhere is supposed, in this view, to be governed by the laws of

physics and chemistry. There is no freedom, no choice, no values, and no moral priority; these are merely subjective epiphenomena of the mind which in no way causally influence the course of physical events in the brain or in the natural world. "No physical action waits on anything but another physical action" is a favorite quotation in support of this position.

On the other hand, if our new thinking is correct, the physical and chemical forces in the brain, though still present and operating, are enveloped and programmed by the higher laws and dynamics of conscious and subconscious mental processes. The more highly evolved "emergent" mental properties of brain action determine when, where, and how the brain's molecular events will occur but without interfering with the laws of physics and chemistry at the molecule level—much as TV programs control the pattern of electron flow to the television screen without interfering with the physics of electron emission. Brain cell excitation no longer waits solely on biophysical forces but also obeys a higher command involving feelings, wants, choice, reasoning, moral values, and all other "things of the mind." The subjective dynamics of mind and consciousness transcend and control brain physiology at the same time that they are determined by it.

Our willed actions and choices, according to this new doctrine, are determined by our personal subjective wants and desires (we do what we subjectively want to do) as well as by all the other collective cognitive properties that make up the inner self. Willed action and decision making thus become much more than a mere physicochemical sequence of brain physiology or of its quantum mechanics or of any other ultimate wave-particle energies within the atoms of the brain—regardless of how nonmechanistically the ultimate building blocks of matter may be conceived currently in the so-called new physics. Unlike reductive physicalist explanations, the downward control outlook resolves the freewill-determinism paradox in a way that does not exclude moral choice and responsibility.

The rich, diverse, holistic qualities and properties of both human and nonhuman nature are retained in our revised scientific description. Rather than emphasize the ultimate subatomic building blocks of creation, the emphasis is on the supersedent properties of the new forms, patterns, and shapes in which the building blocks are successively assembled. For example, we can still believe (despite the "new physics") that the proverbial "solid table" is as solid and hard as ever and regardless of subatomic makeup is very unlike soft Jello. The diverse higher qualities of nature become recognized in their own form to be ineliminable, irreducible, and causally potent aspects of reality.

Rather than describe an impersonal, uncaring, strictly "physically driven" cosmos, science on these revised terms presents a universe gov-

erned not only by physical forces but also by the higher, more evolved vital, mental, cultural, and other human and social forces which surround, move, and direct us in the civilized world. The forces embodied in politics, education, and religion, for example—which are full of purpose, personal caring, value, and meaning—are just as real and causal in the new outlook as the properties of molecules and atoms. Evolution on these "downward control" terms involves a gradual emergence of increased purpose and meaning among the forces that move and govern living things.

It is evident that we come out with a vastly transformed scientific view of ourselves and the world and that this changed cosmology of science no longer stands in utter conflict with common experience and traditional humanistic views. The humanities get a long overdue boost, and the relation of science to values is turned around. The role and scope of science itself are expanded to include a part in determining values [8]. Whereas scientific thinking traditonally had presented a value-devoid mass-energy cosmos that excluded and destroyed values and purpose, freedom and dignity, higher meaning, and most everything else religion stands for, the new mentalist outlook offers by contrast something that ethics and religion can live with. It is no longer a logical necessity that religious belief and scientific belief be kept separate in "mutually exclusive realms" of human thought. Science, ethics, and liberal religion can be fused and harmonized.

V

Among the far-reaching consequences of these changed beliefs in science, perhaps the most critical from the standpoint of the future are the implications concerning values and moral priorities with their potential influence on social policy and human decision making generally. If our starting affirmation is correct that the fate of the biosphere hangs on the kinds of beliefs and associated values mankind elects to live and govern by, it becomes most important to understand the types of value and moral priorities which these changed beliefs might foster. I have tried elsewhere to analyze and project the sorts of moral directives that would seem to arise from such a revised belief framework [8, 9], concluding that the resultant values would be the kinds needed to correct worsening global ills and to establish a sustainable civilization.

A belief system is favored in which the most sacred things in life are neither reduced to quantum physics nor set off apart in another realm of "otherworldly" existence. Our going model of the conscious mind does not support the idea of a separate existence of unembodied conscious experience apart from the functioning brain and is judged to have further weakened the case for a dualist or otherworldly reference frame

for morality, which already had long seemed untenable from the standpoint of science. Transcendent values, now a part of scientific reality, become expressed in terms of *this life* and *this world,* which in turn become all the more sacred without otherworldly rewards or redemption.

Historically, the most commonly accepted authority for moral right and wrong has been the creative force system, agency, or power (variously conceived in different faiths) that made and moves the universe and created humanity. In the eyes of science, this becomes the constructive forces involved in evolution with its trends toward increased quality, higher forms of control, greater diversity, awareness, and meaning including principles that have worked successfully over eons to create life and to improve the overall quality of existence. Whereas these principles are not conceived in science to have appeared full blown in advance in some otherworldly intellect but to have evolved gradually, they nevertheless have similar cosmic influence and creative power and merit similar respect in determining right and wrong.

In a sense, it can be said that our scientific framework for values and belief translates the theological "God's will" into that which serves to aid and impel the creative forces of evolving nature, including, of course, human nature in its cultural as well as biological aspects. Scientific concepts of causal determinism make it impossible to separate the creative forces from creation itself. The two are inextricably interfused such that what one does to one is done to the other. Following the logical implications of these and related observations, we come out with a reverent respect for evolving nature, including *human* nature, conceived in strictly monistic this-world terms. A sense of higher meaning is provided in the larger scheme of things, with rich value and moral directives. It becomes ethically wrong in such a framework to degrade or demean this life and this world, the most sacred things we know, by treating them as only a way station to something better beyond.

Combining such considerations with the inherent system of values already inbuilt in human nature, and forming a basic common denominator on which all belief systems are built, I arrive at a set of beliefs and associated values that to me are both appealing and credible. Based in the truth and worldview of science, they are seemingly in tune with reality and would tend to preserve and enhance our world instead of destroying it. The kind of moral code that emerges would make it not merely unwise but basically immoral, even sacrilegious to plan and build for nuclear annihilation, to pollute, to deplete irreplaceable resources, to thoughtlessly eradicate other species, and so on, or in any way to mindlessly despoil the quality of the biosphere for future generations. A strong moral basis emerges for population controls, for environmental protection, and for other measures and policies that would serve to

ensure and enhance the long-term quality and beauty of this-world existence.

For practical purposes, the ultimate criterion for determining whether something is morally right or wrong works out simply to be the extent to which it preserves or improves the quality of this-world existence. The reference is not to my own existence particularly, or yours, or to this or that nation's, or even to this or the next generation's—though it may be, and usually is, all of these. When conflict arises, however, as between the "rights" of this or that individual, nation, or species, then a higher standard for resolving right and wrong is needed and becomes the quality of existence as perceived in a broad long-term evolutionary or transcendent "godlike" perspective. Most people readily agree with this criterion as something in accord with common intuition and almost obvious. It is not, however, a simplistic measuring stick. Diversity, contrast, competition, and even conflict and death play vital roles in the evolutionary advancement of the quality and meaning of life. Goodness and morality would lose their meaning if everyone were good and moral all the time, just as humanity is bound to undergo a serious decrement in meaning if the world becomes merely one vast human habitat designed primarily for sustaining a maximum of humanity.

As with any ethical system, much room is left for argument on specific issues. An argument over moral priorities, however, can at least become rational once agreement is reached regarding the ultimate criteria. The new cosmology of science, accepting, on the one hand, the primacy of conscious mental and vital forces, while rejecting, on the other, dualist otherworldly or supernatural existence, contains many compromise features offering value criteria and a framework for belief intermediate between the two main opposing ideologies currently dominant in the Communist and Free worlds. These compromise "middle way" features of the new belief system with its basis in the neutral universality of scientific truth would seem to make it a possible candidate for a "global ethic" to provide common ethical foundations on which all nations could work together for international justice, nuclear controls, and preservation of biospheric quality—perhaps through world government. Much more than otherworldly guidelines or more narrow anthropocentric, humanitarian, hedonistic, or relativistic ethics, the kind of global ethic upheld in our new "mentalist" beliefs would help to combat the looming crises in worsening world conditions. As a prescription for the plight of the planet and the human predicament, it provides a single noncatastrophic, even humane remedy directed at the underlying root cause.

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DYSGENESIS

O Child of nature, that you should be
Twisted and torn from the tree.
Unfinished and unprepared
To enter into this world's fair.

To push against this irregular grain
Is a task for reason's strain.
To observe, suggest, test, and so to prove;
This is the manner of reason's muse.

What could it be that went amiss?
Was it a wild meiotic dehisce,
An extra genome, a crowded gene,
An errant enzyme—the fiend?

What is the question, what indeed;
Where others fail, can we succeed?

MACDONALD DICK II